

## APPENDIX

### 1. CONTRACTIONS

AC&W	Aircraft Control and Warning System	KT	Knot(s)
ACCRY	Accuracy	LLCC	Low Level Circulation Center
ACFT	Aircraft	LVL	Level
AIREP	Aircraft Weather Report(s) (Commercial and Military)	M	Meter(s)
ANT	Antenna	M/SEC	Meters per Second
APT	Automatic Picture Transmission	MAX	Maximum
ARWO	Aerial Reconnaissance Weather Officer	MB	Millibar(s)
ATT	Attenuation	MET	Meteorological
AVG	Average	MIN	Minimum
AWN	Automated Weather Network	MOHATT	Modified Hatrack
BRG	Bearing	MSN	Mission
CDO	Central Dense Overcast	NAV	Navigational
CI	Current Intensity	NEDN	Naval Environmental Data Network
CLD	Cloud	NEDS	Naval Environmental Display Station
CLSD	Closed	NESS	National Environmental Satellite Service
CNTR	Center	NET	Near Equatorial Trough
CONF	Confidence (number)	NM	Nautical Mile(s)
DEG	Degree(s)	NOAA	National Oceanic and Atmospheric Administration
DIAM	Diameter	NTCC	Naval Telecommunications Center
DIR	Direction	OBS	Observation(s)
DMSP	Defense Meteorological Satellite Program	PCN	Position Code Number
ELEV	Elevation	PSBL	Possible
FLT	Flight	PTLY	Partly
GOES	Geostationary Operational Environmental Satellite	QUAD	Quadrant
HATRACK	Hurricane and Typhoon Tracking (numerical forecast)	RADOB	Radar Observation
HGT	Height	RECON	Reconnaissance
HPAC	Mean of XTRP and Climatology	RNG	Range
HU	Hurricane	RPD	Rapid
HR	Hour(s)	SAT	Satellite
HVY	Heavy	SFC	Surface
ICAO	International Civil Aviation Organization	SLP(MSLP)	Sea Level Pressure (Minimum Sea Level Pressure)
IR	Infrared	SMS	Synchronous Meteorological Satellite
KM	Kilometer(s)	SPOL	Spiral Overlay
		SRP	Selective Reconnaissance Program
		STNRY	Stationary

ST	Super Typhoon
TC	Tropical Cyclone
TCARC	Tropical Cyclone Aircraft Reconnaissance Coordinator
TCM	Tropical Cyclone Model
TD	Tropical Depression
TIROS	Television Infrared Observation Satellite
TS	Tropical Storm
TY	Typhoon
TUTT	Tropical Upper Tropospheric Trough
VEL	Velocity
VIS	Visual
VSBL	Visible
WESTPAC	Western Pacific
WMO	World Meteorological Organization
WND	Wind
WRS	Weather Reconnaissance Squadron
XTRP	Extrapolation
Z	Zulu Time (Greenwich mean time)

## 2. DEFINITIONS

**BEST TRACK** - A subjectively smoothed path, versus a precise and very erratic fix-to-fix path, used to represent tropical cyclone movement.

**CENTER** - The axis or pivot of a tropical cyclone. Usually determined by wind, temperature or pressure distribution.

**CYCLONE** - A closed atmospheric circulation rotating about an area of low pressure (counterclockwise in the northern hemisphere).

**EPHEMERIS** - Position of a body (satellite) in space as a function of time. When no geographical reference is available for gridding satellite imagery, then only ephemeris gridding is possible which is solely based on the theoretical satellite position and is susceptible to errors from satellite pitch, orbit eccentricity and the non-spherical earth.

**EXTRATROPICAL** - A term used in warnings and tropical summaries to indicate that a cyclone has lost its "tropical" characteristics. The term implies both poleward displacement from the tropics and the conversion of the cyclone's primary energy sources from release of latent heat of condensation to baroclinic processes. The term carries no implications as to strength or size.

**EYE** - "EYE" is used to describe the central area of a tropical cyclone when it is more than half surrounded by wall cloud.

**MAXIMUM SUSTAINED WIND** - Maximum surface wind speed averaged over a 1-minute period of time. Peak gusts over water average 20 to 25 percent higher than sustained wind.

**RECURVATURE** - The turning of a tropical cyclone from an initial path toward the west of northwest to the north then northeast.

**SIGNIFICANT TROPICAL CYCLONE** - A tropical cyclone becomes "significant" with the issuance of the first numbered warning by the responsible warning agency.

**SUPER TYPHOON/HURRICANE** - A typhoon/hurricane in which the maximum sustained surface wind (1-minute mean) is 130 kt or greater.

**TROPICAL CYCLONE** - A nonfrontal low pressure system of synoptic scale developing over tropical or subtropical waters and having a definite organized circulation.

**TROPICAL CYCLONE AIRCRAFT RECONNAISSANCE COORDINATOR** - A CINCPACAF representative designated to levy tropical cyclone aircraft weather reconnaissance requirements on reconnaissance units within a designated area of the PACOM and to function as coordinator between CINCPACAF, aircraft weather reconnaissance units, and the appropriate typhoon/hurricane warning center.

**TROPICAL DEPRESSION** - A tropical cyclone in which the maximum sustained surface wind (1-minute mean) is 33 kt or less.

**TROPICAL DISTURBANCE** - A discrete system of apparently organized convection--generally 100 to 300 miles in diameter--originating in the tropics or subtropics, having a non-frontal migratory character, and having maintained its identity for 24 hours or more. It may or may not be associated with a detectable perturbation of the wind field. As such, it is the basic generic designation which, in successive stages of intensification, may be classified as a tropical depression, tropical storm or typhoon (hurricane).

**TROPICAL STORM** - A tropical cyclone with maximum sustained surface winds (1-minute mean) in the range of 34 to 63 kt, inclusive.

**TROPICAL UPPER TROPOSPHERIC TROUGH (TUTT)** - "A dominant climatological system, and a daily synoptic feature, of the summer season over the tropical North Atlantic, North Pacific and South Pacific Oceans," from Sadler, James C., Feb. 1976: Tropical Cyclone Initiation by the Tropical Upper Tropospheric Trough. (NAVENVPREDRSCHFAC Technical Paper No. 2-76).

**TYPHOON/HURRICANE** - A tropical cyclone in which the maximum sustained surface wind (1-minute mean) is 64 kt or greater. West of 180 degrees longitude they are called typhoons and east of 180 degrees they are called hurricanes. Foreign governments use these or other terms for tropical cyclones and may apply different intensity criteria.

**WALL CLOUD** - An organized band of cumuli-form clouds immediately surrounding the central area of a tropical cyclone. The wall cloud may entirely enclose the eye or only partially surround the center.

# DISTRIBUTION

AFGWC (2)  
 AFGL/LYU (2)  
 AMER EMBASSY, BANGKOK (6)  
 ANDREWS UNIV (1)  
 ARIZONA STATE UNIV (1)  
 ARRS/CC (4)  
 AWS/DNT (5)  
 AWS/DOR (5)  
 BUR OF MET, BRISBANE (2)  
 BUR OF MET, MELBOURNE (1)  
 BUR OF MET, PERTH (1)  
 CAF WEACEN TAIWAN (3)  
 CATH UNIV OF AMER (2)  
 CENWEABUR TAIWAN (3)  
 CINCPAC (2)  
 CINCPACAF/DOW (2)  
 CINCPACFLT (5)  
 CIVIL DEFENSE (GUAM) (4)  
 CNO WASHINGTON, DC (1)  
 COLORADO STATE UNIV (2)  
 COLORADO STATE UNIV (LIBR) (1)  
 COMFAIRECONRON ONE (VQ-1) (4)  
 COMLOGSUPFORSEVENTHFLT (1)  
 COMNAVAIRSYS COM (1)  
 COMNAVFACENGCOMPACDIV (1)  
 COMNAVFORJAPAN (1)  
 COMNAVMAIANAS (1)  
 COMNAVSURFPAC (2)  
 COMPATRECONFORSEVENTHFLT (1)  
 COMPHIBGRU ONE (2)  
 COMSC (1)  
 COMSEVENTHFLT (2)  
 COMSUBGRU SEVEN (2)  
 COMSUBPAC (1)  
 COMTHIRDFLT (1)  
 COMUSNAVPHIL (2)  
 DDC VA (12)  
 DEPT AIR FORCE (1)  
 DET 2, 1WW (2)  
 DET 2, 7WW (2)  
 DET 4, 1WW (2)  
 DET 4, HQ AWS (2)  
 DET 5, 1WW (3)  
 DET 8, 30WS (2)  
 DET 10, 30WS (1)  
 DET 15, 30WS (1)  
 DET 17, 30WS (1)  
 DET 18, 30WS (1)  
 DISTAD MARSHALLS (1)  
 DMA WASHINGTON, DC (1)  
 ENVSCISUPGRU (5)  
 ESCAP THAILAND (2)  
 FAA (GUAM) (5)  
 FLENUMWEACEN (2)  
 FLEWEACEN NORFOLK (1)  
 FLEWEACEN PEARL HARBOR (2)  
 FLEWEACEN ROTA (1)  
 FLEWEAFAC SUITLAND (1)  
 FLORIDA STATE UNIV TALLAHASSEE (2)  
 GEN MTE DEPT THAILAND (2)  
 GEOLOGICAL SURVEY, GUAM (1)  
 GOVERNOR OF GUAM (4)  
 GOVERNMENT OF NORTHERN MARIANAS (2)  
 GUAM PUBLIC LIBRARY (5)  
 INDIA MET DEPT (2)  
 JAPAN MET AGENCY (3)  
 JASDF TOKYO, JAPAN (1)  
 LIBR OF CONGRESS (EXCHANGE & GIFT DIV) (2)  
 LOS ANGELES PUBLIC LIBR (1)  
 MAC/HO (2)  
 MCAS FUTENMA (1)  
 MCAS IWAKUNI (2)  
 MCAS KANOEHE BAY (2)  
 MET DEPT BANGKOK (2)  
 MET RESEARCH INSTITUTE LIBR, JAPAN (3)  
 NASA GREENBELT, MD (3)  
 NASA WOLLOPS ISLAND (1)  
 NAT CLIM CNTR, NC (1)  
 NATWEASERV FOROFF HONOLULU (2)  
 NATWEASERV PACREG (2)  
 NAVAL ACADEMY (1)  
 NAVWEASERVFAC ALAMEDA (1)  
 NAVWEASERVFAC JACKSONVILLE (1)  
 NAVWEASERVFAC YOKOSUKA (2)  
 NEPRF, MONTEREY, CA (8)  
 NESS/SFSS (2)  
 NHC, NOAA (2)  
 NOAA/EDS CORAL GABLES, FL (4)  
 NOAA/EDS WASHINGTON, DC (2)  
 NOAA/ERL BOULDER, CO (2)  
 NOAA/ERL MIAMI (1)  
 NOAA/HYDROLOGY BR SILVER SPRING, MD (1)  
 NOAA/LIBRARY ROCKVILLE, MD (1)  
 NOAA/NESS WASHINGTON, DC (2)  
 NOAA/PMEL SEATTLE, WA (2)  
 NPGS DEPT OF MET (4)  
 NPGS LIBR (1)  
 NWESA (1)  
 NWSA ASHEVILLE (1)  
 NWSA AGANA (1)  
 NWSA ATSUJI (1)  
 NWSA BARBERS POINT (1)  
 NWSA CUBI POINT (1)  
 NWSA KADENA (2)  
 NWSA MISAWA (1)  
 OCEANAV (3)  
 OKINAWA MET OBS (1)  
 OLG/HQ AWS (1)  
 OUSDRE, WASHINGTON, DC (2)  
 PAGASA RP (5)  
 ROYAL OBSERVATORY HONG KONG (4)  
 TAIWAN UNIV (3)  
 TEXAS A&M UNIV (1)  
 TIME INC., NY (1)  
 TTPI SAIPAN (8)  
 TYPHOON COMM SECR (1)  
 UNIV OF CHICAGO (1)  
 UNIV OF GUAM (2)  
 UNIV OF HAWAII DEPT OF MET (3)  
 UNIV OF HAWAII LIBR (1)  
 UNIV OF MEXICO (1)  
 UNIV OF RP (2)  
 UNIV OF WASHINGTON (1)  
 USAFSAAS/TMWF (1)  
 USDOC/NOAA (1)  
 USS BLUE RIDGE (LCC 19) (2)  
 USS CONSTELLATION (CV 64) (2)  
 USS CORAL SEA (CV 43) (1)  
 USS ENTERPRISE (CVN 65) (1)  
 USS KITTY HAWK (CV 63) (1)  
 USS LONG BEACH (CGN 9) (2)  
 USS MIDWAY (CV 41) (2)  
 USS NEW ORLEANS (LPH 11) (2)  
 USS OKINAWA (LPH 3) (1)  
 USS OKLAHOMA CITY (CG 5) (2)  
 USS RANGER (CV 61) (2)  
 USS TARAWA (LHA 1) (1)  
 USS TRIPOLI (LPH 10) (1)  
 WEA SERV MET OBS (2)  
 1WW/DON (6)  
 3AD/DOX (1)  
 3WW/DNC (1)  
 5WW/DNC (1)  
 7WW/DON (1)  
 30WSQ (3)  
 41RWRW (2)  
 43SW/OI (2)  
 54WRS (3)  
 3360 TCHTG (1)

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

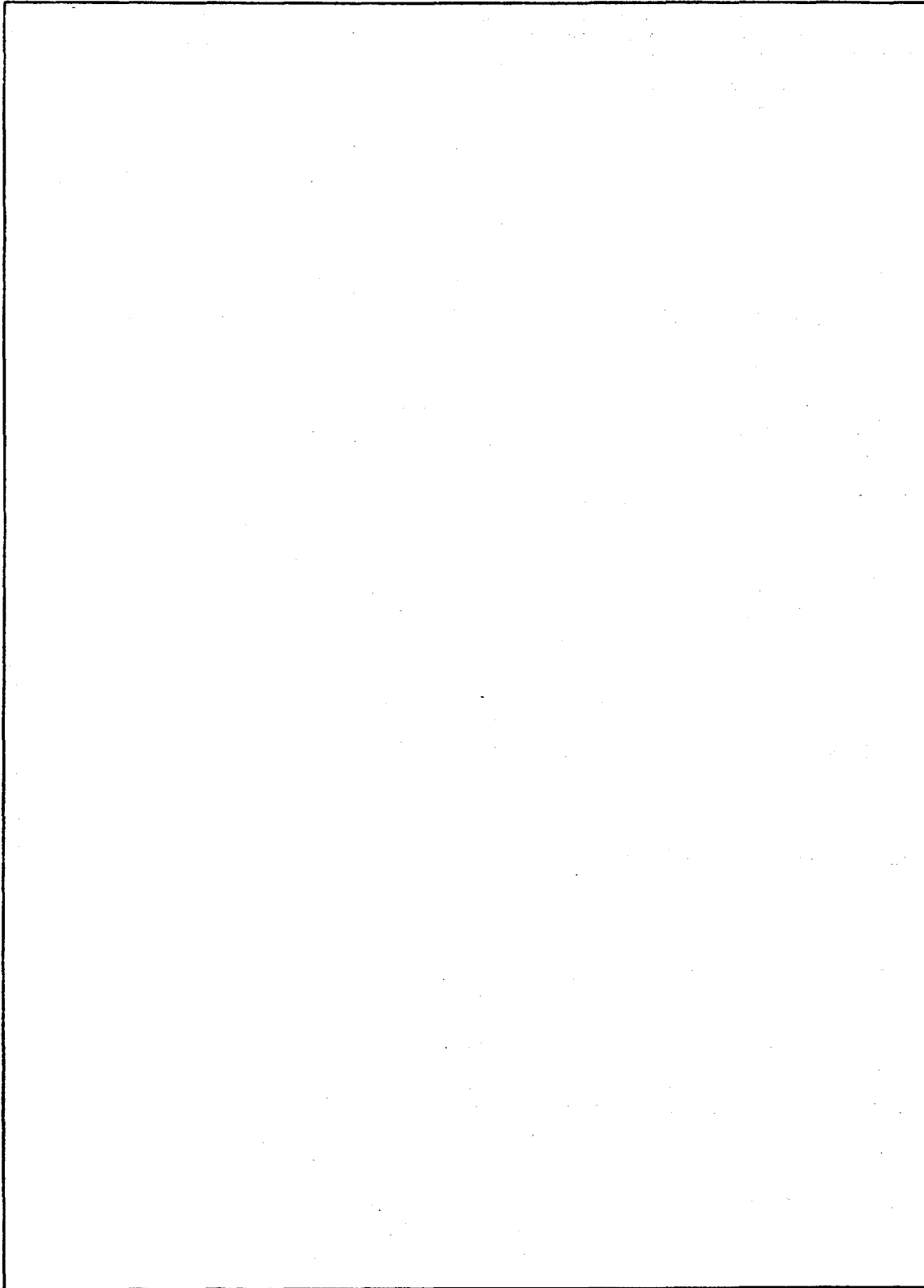
REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Annual Typhoon Report 1978	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  ANNUAL TYPHOON REPORT 1978		5. TYPE OF REPORT & PERIOD COVERED  Annual (JAN-DEC 1978)
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS FLEET WEATHER CENTRAL/JOINT TYPHOON WARNING CENTER (FLEWEACEN/JTWC), GUAM FPO SAN FRANCISCO 96630		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS FLEET WEATHER CENTRAL/JOINT TYPHOON WARNING CENTER (FLEWEACEN/JTWC), GUAM FPO SAN FRANCISCO 96630		12. REPORT DATE 1978
		13. NUMBER OF PAGES 166
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)  UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Tropical cyclones                      Tropical storms Tropical cyclone forecasting          Tropical depressions Tropical cyclone research              Typhoons Tropical cyclone steering model       Meteorological satellite Tropical cyclone fix data              Aircraft reconnaissance		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Annual publication summarizing the tropical cyclone season in the western North Pacific, Bay of Bengal, and the central North Pacific. A brief narrative is given on each typhoon in the western North Pacific including the best track. Pertinent reconnaissance data used to construct the best tracks are provided. Forecast verification data and statistics for the JTWC are summarized. Research efforts at the JTWC are discussed briefly.		

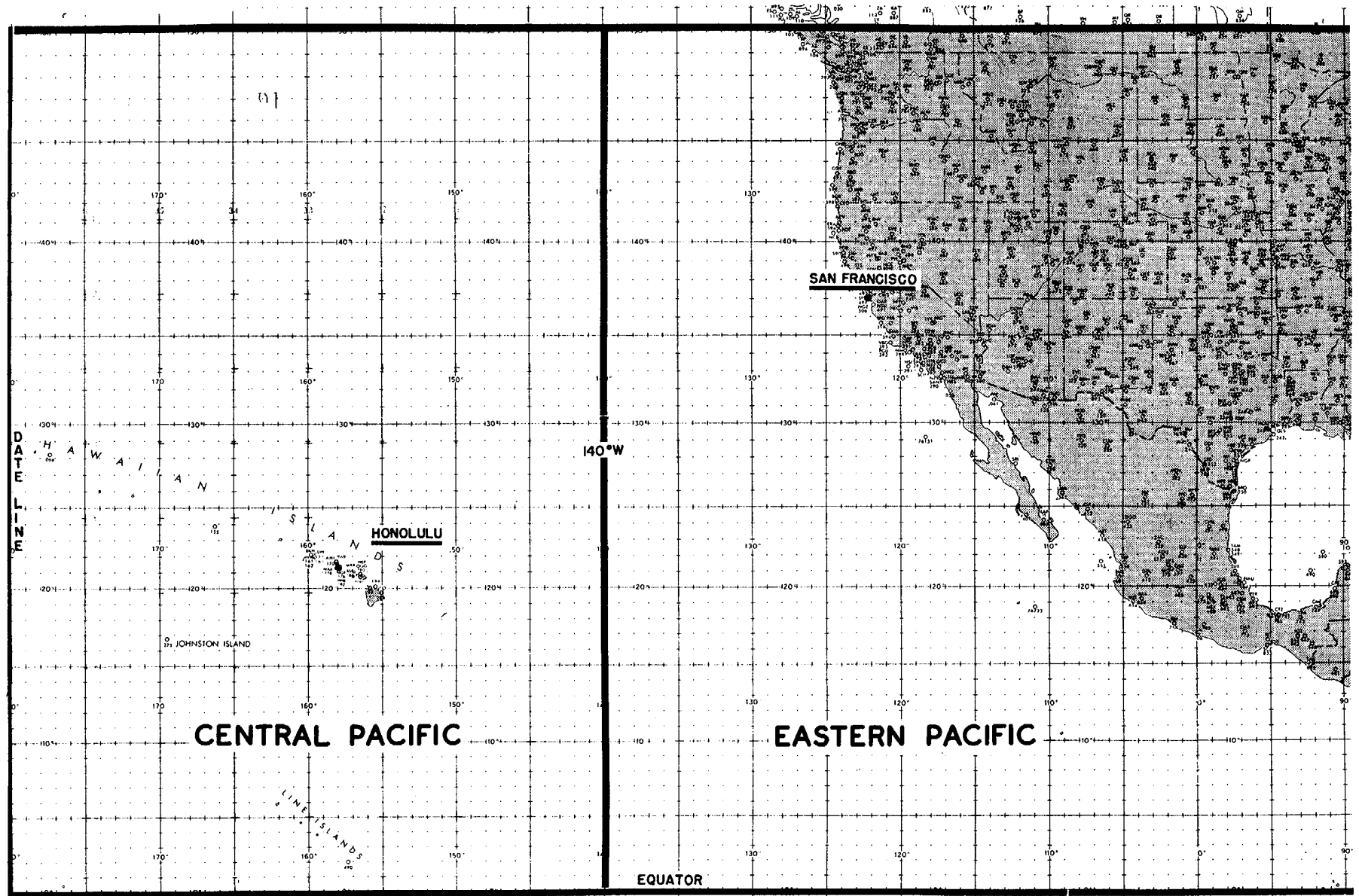
DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE  
S/N 0102-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)





**Areas of Responsibility - Central and Eastern Pacific Hurricane Centers**

JOINT TYPHOON WARNING CENTER

